



MODERN TRENDS IN PEDAGOGICAL PRACTICES FOR TEACHER EDUCATIONAL INSTITUTIONS

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ABSTRACT

Liberalization, Privatization, Globalization and Digitalization in Education has influenced our educational system in a paradigm way. Teaching learning process, the nucleus of entire education system has also been effected in the same manner. Today's teaching strategies are not only confined to the product aspect but also majority of instructional system is fully governed by pedagogical aspects which is nothing but process of learning. In this investigation we are to explore the modern Pedagogical issues which may be practiced in our regular class room instruction in order to achieve better learning outcome.

KEYWORDS: Innovative Practices; Pedagogical Issues; Child Centered and Joyful Learning; Teacher Education.

1. INTRODUCTION

Teacher Education in India is now in a transition phase because of the rapid change in social structure, technology and values among citizens. Liberalization, Privatization, Globalization and Digitalization in education in recent years has greatly influenced Indian educational system in a paradigm way. Recent researches revealed that the teaching learning process which is the nucleolus of entire education system has been affected in the same manner. This paradigm shift in the field of education in India was rightly reflected in the National Curriculum Framework-2005 (NCF-2005) and National Curriculum Framework for Teacher Education (NCFTE-2009) which are the most comprehensive documents in the history of Indian education to make in India for next generation. The guiding principle of NCFs is based on the child centric progressive learning which in turn resulted the paradigm shift of teacher's role in the present context. Earlier teachers followed traditional strategies in which emphasis had been laid upon thorough understanding of the teaching content. They tried to link the imparted knowledge in different way while disseminating the information to students. With the advent of technology, new educational teaching learning theories and modern resources specifically multimedia oriented resources, the traditional teaching strategies are no longer appropriate and adequate to support the classroom teaching learning process as well as the mass education system. For meaningful and joyful learning it is necessary for a teacher to possess not only sound knowledge of the teaching content to be taught but also well-developed understanding of how students learn i.e. the new pedagogical approaches that are appropriate to their specific requirements and also commensurate with the capabilities of students. They should be conversant with the stages of their students and also be critical compassionate and engaged knowledge imparter who can contribute in the process of teaching improvements and social change. So it is clear that the emphasis should be laid upon process-oriented skills which is related to pedagogy rather than product which is related to mastery in the content knowledge.

Thus mode of teaching should be converted into joyful process of child-centric learning to generate interest in students and motivate them to stay back in the classroom than to run away from it. Education should become a fun and thrill to them rather than burden and boredom. So the paradigm shift occurs from teacher dominated unidirectional classroom to that of child-centric joyful, burden less partnership between the teacher and the learner and their peers. In this way teaching strategies have changed their route from transmission to transaction and ultimately transformation.

This article explores some of the modern innovative pedagogical practices for classroom instruction in order to achieve better outcome to commit joyful and congenial environment to our juvenile learners. The key roles of the teacher educational institutions are to practice, improve and encourage teacher interns for applying these innovative modern teaching learning strategies to classroom situations. Some of modern innovative pedagogical practices i.e. teaching learning strategies are discussed and evaluated analytically in the foregoing part.

2. MODERN INNOVATIVE PEDAGOGICAL PRACTICES

2.1 Teaching-learning Strategy using Multimedia

I hear and I forget.

I see and I believe.

I do and I understand. – Confucius.

Research has shown that people remember 20% of what they see, 40% of what

they see and hear, but about 75% of what they see and hear and do simultaneously (Lindstrom, 1994). Multimedia is now permeating the educational system as a tool for effective teaching and learning as with multimedia, the communication of the information can be done in a more effective manner and it can be an effective instructional medium for delivering information. A multisensory experience can be created for the audience or learners, which, in turn, elicits positive attitudes toward the application. Multimedia has also been shown to elicit the highest rate of information retention and result in shorter learning time (Ng and Komiya, 2000).

Multimedia, defined, is the combination of various digital media types such as text, images, sound and video, into an integrated multisensory interactive application or presentation to convey a message or information to an audience. In other words, multimedia means "an individual or a small group using a computer to interact with information that is represented in several media, by repeatedly selecting what to see and hear next" (Agnew et. al, 1996). Multimedia application design offers new insights into the learning process to represent information and knowledge in a new and innovative way (Agnew, Kellerman & Meyer, 1996). The use of computer assisted multimedia as a supplement to traditional teacher directed instruction produces positive effects. It enhances the academic performances improvements to the pre-service teachers. Computer assisted multimedia applications enhances learning rates. Student's score on delayed tests indicate that the retention of content learned using computer assisted multimedia application is superior to retention following traditional instruction. Multimedia instructional strategy at secondary level is feasible because of its reproducibility and cost management. A model of multimedia based teaching learning strategy has been collated in Figure 1.

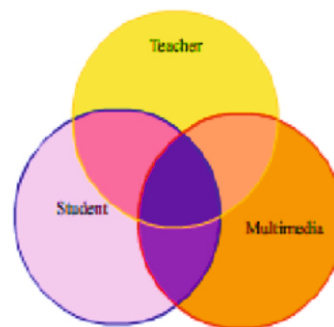


Figure 1. Multimedia based teaching learning strategy

2.2 Convergent-divergent thinking strategy

Divergent thinking involves the exploration of various creative ideas in order to generate many possible solutions. It is a 'right-brain' creative process and vital for those competing in the 21st century education. On the other hand students use convergent thinking with many of the tasks they are assigned and on standardized tests where they determine the one correct answer. It is a "left-brain" or logical process.

Convergent thinking the term coined by Joy Paul Guilford is the type of thinking that focuses on coming up with the single best, well-established or most often cor-

rect answer to a problem leaving no room for ambiguity. It emphasizes the memory and correspondingly more recalled and applied to real world problems associated with similar contexts that may be encountered in future. So using the logical and thoughtful combination of convergent and divergent thinking as teaching learning strategy in educational arena is itself a creative innovation. Figure 2. describes the convergent and divergent thinking strategy.

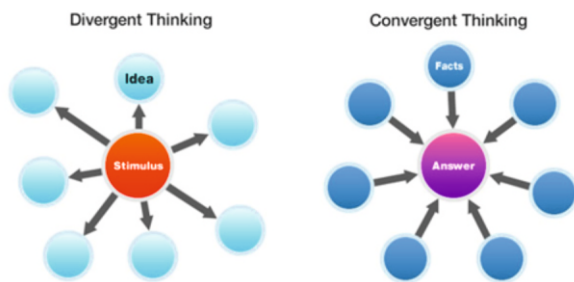


Figure 2. Convergent and divergent thinking strategy

2.3 Mind Mapping

Mind mapping were developed by Tony Buzan in the late 60s is a process of helping students make notes that used only key words and images. Mind mapping can be used by teachers to explain concepts in an innovative way. They are much quicker to make and much easier to remember and review because of their visual quality. The nonlinear nature of mind maps makes it easy to link and cross-reference different elements of the map (Fig.3.). As a pedagogical tool, the visibility of Mind Mapping provides an effective approach for promoting better understanding in students. Its flexibility also means that it possesses several uses in the classroom. The application of mind mapping strategy includes the following: (1) Using Mind Mapping for lesson planning can help teachers identify a logical teaching route and increases recall of the subject matter. This can boost teaching confidence and facilitate the smooth running of lessons (Boyson, 2009), (2) Using Mind Mapping as a pedagogical strategy led to improvements in pupils learning. This was primarily built on helping them to develop sound categorization skills and then supporting them in depicting this information within a visual format, (3) It is a cost effective and practically no cost teaching learning strategy, (4) Mind Mapping is a powerful cognitive tool which can be used in a variety of ways because of its ability to evoke associative and non-linear thinking, (5) Mind Mapping to be a useful strategy for introducing new concepts, providing a whole-class focus for a large research project, assessing student learning and offering greater choice in how students complete assignments and projects, (6) Using mind mapping software is a successful way to support children's exploration and presentation of novel ideas.



Figure 3. Mind mapping strategy

2.4 Chunking strategy

Chunking refers to the strategy of breaking down information into bite-sized pieces so the brain can more easily digest new information. The reason the brain needs this assistance is because working memory, where we manipulate information, holds a limited amount of information at one time. Chunking is a good useful memorizing cognitive tool often used for taking individual units of information and grouping them into larger units. By separating disparate individual elements into larger blocks, information becomes easier to retain, recall and recognition.

The chunking strategy is a very good pedagogical innovation which minimizes cognitive overload and thereby increasing the learner's mental storage capacity. Chunking by category adds meaning and depth to learning. It also reduces the amount to remember and enhances the mental activities. Teacher may use this strategy whenever applicable in order to promoting maximum learning outcome. Chunking doesn't only work for your typical linear instruction, it also works for learning objects, for non-linear approaches to learning as well as discovery learning, because it groups together conceptually related information. Content that is conceptually related is meaningful, making it easier to understand.

Mnemonic	
Please	P - Parenthesis
Excuse	E - Exponent
My	M - Multiplication
Dear	D - Division
Aunt	A - Addition
Sally	S - Subtraction

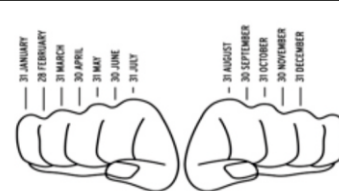


Figure 4. Mnemonic strategy

2.5 Z to A Approach

Z to A approach of teaching strategy is just opposite to traditional one and the novelty lies in its art of presentation. This method was developed by Gallileo by his mythical experiment when he drops a cannon ball and a feather from the top of the world famous leaning tower of Pisa and finally explained and establish theorem of falling matter. So in Z to A approach attempts were made to explain the application or proof part of a particular concept first and then the theorem. The students would get interest in knowing, what is the cause of the experiment. This approach makes a particular concept clear; students develop interest to know exactly the concept and create long lasting memory/ correlation of a concept. So this pedagogical technique of teaching learning process generates meaningful learning in students.

2.6 Scaffolding strategy

Scaffolding is a creative pedagogical tool for teaching strategy to facilitate learning in classroom. Scaffolding is formulated from Vygotsky's socio-cultural theory and his concept of zone of proximal development. It emphasizes active participation or greater degree of control from students learning. For successful scaffolding, five key features need to be addressed. These are: (1) Motivate or enlist the child's interest related to the task, (2) Simplify the task to make it more manageable and achievable for a child, (3) Provide some direction in order to help the child focus on achieving the goal, (4) Clearly indicate differences between the child's work and the standard or desired solution, (5) Reduce frustration and risk, (6) Model and clearly define the expectations of the activity to be performed (Bransford, Brown, and Cocking, 2000). Scaffolding is a pragmatic approach which involves the use of typical examples and applications to illustrate and illuminate the curriculum. This strategy suggests that content learned through appropriate context will be better anchored in the memory and correspondingly easily recalled and applied to real world problems associated with similar contexts that may be encountered in the future.

2.7 Collaborative and cooperative learning

Cooperative learning is an instructional strategy that simultaneously addresses academic and social skill learning by students. It is an effective pedagogical tool and has been reported highly successful in classroom because of its increasing need for interdependence in all levels providing students with the tools to effectively learn from each other. Students work towards fulfilling academic and social skill and it is a team approach. While collaborative learning is commonly illustrated when groups of students work together to search for understanding meaning, or solution or to create an artifact or product of their learning. Further collaborative learning redefines traditional student-teacher relationship in classroom because activities can include collaborative writing, group projects, joint problem solving, debates study teams and other activities in which students team together to explore a significant question or create a meaningful project.

Cooperative and collaborative learning are instructional approaches in which students work together in small groups to accomplish a common learning goal. They need to be carefully planned and executed, but they don't require permanently formed groups. Where used cooperative learning can help to develop social skills, communication abilities and even the development of independent learning skills. Many studies also suggest that cooperative learning helps to raise motivation and promotes learning in the cognitive domain.

2.8 Anchored Instruction

The anchored instruction approach is an attempt to help students engage more actively in learning by situating an experience or anchoring instruction around an interesting topic. The learning environments are designed to provoke the kinds of thoughtful engagement that helps students develop effective thinking skills and attitudes that contribute to effective problem solving and critical thinking. Anchored instruction is based on the following principles: (1) Learning and teaching activities should be designed around an "anchor" which is often a story, adventure, or situation that includes a problem or issue to be dealt with that is of interest to the students, (2) Instructional materials should include rich resources students can explore as they try to decide how to solve a problem.

Anchored instruction emphasizes the need to provide students with opportunities to think about and work on problems, which is an emphasis of cognitive constructivists. Anchored instruction also emphasizes group or collaborative problem solving, which is an emphasis of social constructivists.

2.9 Peer Tutoring

Peer tutoring is a flexible, peer mediated teaching learning strategy wherein students are paired together to practice academic skills and master content. Typi-

cally, a higher performing student is paired with a lower performing student to review critical academic or behavioral concepts. Teachers may use peer tutoring to help accommodate a classroom full of diverse students who need more individualized attention. There are many benefits and challenges of peer tutoring that teachers should consider before implementing such a good pedagogical tool in their classrooms. Some benefits of peer tutoring are: (1) Peer tutoring allows for higher rates of student response and feedback, which results in better academic achievement, (2) Peer tutoring creates more opportunities for students to practice specific skills, which leads to better retention, (3) The student tutor gains a deeper understanding of a topic by teaching it to another student, (4) Students involved in peer tutoring have shown more positive attitudes toward learning and develop self-confidence, (5) Peer tutoring often helps students build relationships and practice appropriate social interaction.

In spite of some challenges of this strategy like higher time requirement for planning and parents' confusion due to ignorance about the process peer tutoring can be effective pedagogical tool for meaningful learning inside the classroom of secondary schools with heterogeneous distribution of learners group.

2.10 Mnemonics

A mnemonic is an instructional strategy designed to help students improve their memory of important information. This technique connects new learning to prior knowledge through the use of visual and/or acoustic cues. The basic types of mnemonic strategies rely on the use of key words, rhyming words, or acronyms. Teachers may develop mnemonic strategies or have students come up with their own. Some examples of mnemonics have been collated in Fig.4. In 1967 from a study by Gerald R. Miller the mnemonics increased recall. He found that students who regularly used mnemonic devices increased test scores up to 77%! Many types of mnemonics exist and which type works best is limited only by the imagination of each individual learner. The basic types of mnemonics include Music, Name, Expression/Word, Model, Ode/Rhyme, Note Organization, Image, Connection, and Spelling Mnemonics.

2.10.1 Music Mnemonics

Music is a powerful memory technique and it can work just as well in school, also. Many learners have made songs out of information when a list of items must be learned. Advertising on radio and TV uses this technique to help potential customers remember their products when shopping. Music Mnemonics work best with long lists. For example, some children learn the ABC's by singing the "ABC" song.

2.10.2 Name Mnemonic

In a Name Mnemonic, the 1st letter of each word in a list of items is used to make a name of a person or thing. An example is ROY G. BIV = colors of the spectrum (Red, Orange, Yellow, Green, Blue, Indigo, Violet.)

2.10.3 Expression Mnemonics

This is by far the most popularly used mnemonic. To make an Expression or Word mnemonic, the first letter of each item in a list is arranged to form a phrase or word. Examples include: In English, the 7 coordinating conjunctions are For, And, Nor, But, Or, Yet, So = FANBOYS. The categories in the classification of life Science are Kingdom, Phylum, Class, Order, Family, Genus, Species, Variety = KINGS PLAY CARDS ON FAIRLY GOOD SOFT VELVET.

2.10.4 Model Mnemonics

In a Model Mnemonic, some type of representation is constructed to help with understanding and recalling important information. Examples include a circular sequence model, a pyramid model of stages, a pie chart, and a 5-box sequence. Models should be used in addition to words and lists because they make recall at test time much easier.

2.10.5 Ode or Rhyme Mnemonics

An Ode or Rhyme Mnemonic puts information to be recalled in the form of a poem. Examples include: a. A commonly used Rhyme Mnemonic for the number of days in each month is- 30 days hath September, April, June, and November. All the rest have 31, Fine! February 28 except when 29.

2.10.6 Note Organization Mnemonics

The way textbook and lecture notes are organized can inhibit learning and recall or promote it. In the sense that the organization of notes can promote recall, it is a memory device. Three examples of organizing note formats that promote recall are Note-cards, Outlines, Cornell System etc.

2.10.7 Image Mnemonics

The information in an Image Mnemonic is constructed in the form of a picture that promotes recall of information. These images may be mental or sketched into text and lecture notes.

2.10.8 Connections Mnemonics

In this type of mnemonic, the information to be remembered is connected to something already known. Remembering the direction of longitude and latitude is easier to do when you realize that lines on a globe that run North and South are long and that coincides with LONGitude. Another Connection Mnemonic points out that there is an N in LONGitude and an N in North. Latitude lines must run

east to west, then. There is no N in latitude.

2.10.9 Spelling Mnemonics

Spelling mnemonics were very old tool to remember spelling. As for example: A principal at a school is your pal, and a principle you believe or follow is a rule.

Mnemonics are effective pedagogical tool that can be modified to fit a variety of learning content. This method enhances memory of complex words or ideas and promotes better retention of material to be learned. It is especially beneficial to lower age group students and others who may have difficulty with information recall.

2.11 Microteaching and Simulated Teaching

Micro and simulated teaching was developed by Prof. Dwight Allen and Robert Bush in the teacher preparation programme at Stanford University during the period 1960-67. Microteaching is defined as a system of controlled practice that makes it possible to concentrate on specified teaching behavior and to practice teaching under controlled conditions. While simulated teaching is imitation of real classroom situation. Hence students-teachers experience the reality of the scenario and practice to master all the teaching skills simultaneously is a strategy that fits well with the principles of student-centered and constructivist learning and teaching.

Microteaching is a scaled down, simulated teaching encounter designed for the training of both pre-service and in-service teachers. Its purpose is to provide teachers with the opportunity for the safe practice of an enlarged cluster of teaching skills while learning how to develop simple, single concept lessons in any teaching subject. Microteaching helps teachers improve both content and methods of teaching and develop specific teaching skills such as questioning, the use of examples and simple artifacts to make lessons more interesting, effective reinforcement techniques, and introducing and closing lessons effectively. Immediate, focused feedback and encouragement, combined with the opportunity to practice the suggested improvements in the same training session, are the foundations of the microteaching. Fig.5. Expresses a model diagram of micro and simulated teaching.

Knowledge acquisition, skill acquisition, and transfer are the three different phases of microteaching (Passi BK, 1976). Knowledge acquisition phase is the preparatory, pre-active phase, in which the teacher gets trained on the skills and components of teaching through lectures, discussion, illustration, and demonstration of the skill by the experts. In the interactive, skill acquisition phase, the teacher plans a micro-lesson for practicing the demonstrated skills. The colleagues and peers can act as constructive evaluators which also enable them to modify their own teaching-learning practices. The teacher can reinforce behaviors and skills that are necessary and extinguish that are not needed. Ultimately, they can integrate and transfer this learned skills from simulated teaching situation to real classroom teaching. Micro and simulated teaching which is a positively effective pedagogical tool for student teacher focuses on sharpening and developing specific teaching skills and eliminating errors. It enables understanding of behaviours important in classroom teaching. It increases the confidence of the learner teacher. It is a vehicle of continuous training applicable at all stages not only to teachers at the beginning of their career but also for more senior teachers. A cycle of micro teaching is depicted in Figure 5.

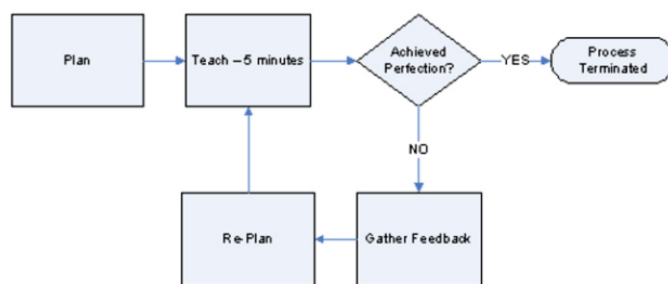


Figure 5. Model diagram of micro and simulated teaching

2.12 Programmed Learning

Programmed learning is a teaching technique or pedagogical tool for effective self-pacing learning in which a learner is presented with a small unit or concept of information, and is asked to answer a question after understanding it. If the answer is correct; the learner may proceed to the next unit or concept of information, otherwise go back to a previous piece of information and proceed from there. Programmed learning is also effective pedagogical teaching-learning strategy based on the principles of small steps, self-pacing, immediate feedback, reinforcement and student testing.

Programmed learning is an educational innovation and auto-instructional device. It is not only a technique for effective learning but also a successful mechanism of feedback device for the modification of teacher-behaviour. Programmed learning has arrived on the educational scene mainly due to the laboratory experiments of Prof.B.F Skinner. Prior to Skinner the concept of "Condition-

ing" as presented by Pavlov and Watson and the 'Law of effect' as formulated by Thorndike are the main historical links in the developing chain of important events. The procedure for shaping behavior as developed by Skinner was called 'operant conditioning' and this finally becomes the basis for programmed learning technology. It involves the following features:

- 1) Learners are exposed to small amounts of information and proceed from one frame or one item of information, to the next in an orderly fashion (this is what is meant by linear).
- 2) Learners respond overtly so that their correct responses can be rewarded and their incorrect responses can be corrected
- 3) Learners are informed immediately about whether or not their response is correct (feedback).
- 4) Learners proceed at their own pace (self-pacing).

The terms "programmed learning" were sometimes interchanged with "programmed training", because the principles and methods were almost identical. If the target audience was industrial or military, researchers used the term programmed training, because training budgets supported the work. But in schools and colleges, the work was often described as programmed learning. Perhaps the only distinction was the way the "terminal behaviours" (the final test demonstrating what the learner had learnt) were arrived at. In training, the goals were decided by a process called task analysis, or critical incident technique. This was based on the key activities which a trained person should be able to do. In educational work, deciding on the terminal test was not so securely grounded.

2.13 Problem Based Learning (PBL)

Problem based learning (PBL) is student centered pedagogy in which students learn about the subject through the experience of solving an open ended problem found in trigger material. It begins with introduction of an ill-structured problem on which all learning is centered. The problem is one that students are likely to face as future professionals. Expertise is developed by engaging in progressive problem solving. The students, individually and collectively, assume major responsibility for their own learning and instruction. Problem based learning is student centered. It makes a fundamental shift from a focus on teaching to a focus on learning. The process is aimed at using the power of authentic problem solving to engage students and enhance their learning and motivation. Most of the learning occurs in small groups rather than in lectures. There are several unique aspects that define the PBL approach:

- 1) Learning takes place within the contexts of authentic tasks, issues, and problems that are aligned with real world concerns.
- 2) In a PBL course, students and the instructor become co-learners, co-planners, co-producers, and co-evaluators as they design, implement, and continually refine their curricula.
- 3) The PBL approach is grounded in solid academic research on learning and on the best practices that promote it. This approach stimulates students to take responsibility for their own learning, since there are few lectures, no structured sequence of assigned readings, and so on.
- 4) PBL is unique in that it fosters collaboration among students, stresses the development of problem solving skills within the context of professional practice, promotes effective reasoning and self-directed learning, and is aimed at increasing motivation for lifelong learning.

Traditional education practices, starting from school through college, tend to produce students who are often disenchanted and bored with their education. They are faced with a vast amount of information to memorize, much of which seems irrelevant to the world as it exists outside of school. Students often forget much of what they learned, and that which they remember cannot often be applied to the problems and tasks they later face in the business world. Traditional classrooms also do not prepare students to work with others in collaborative team situations. Consequently students tend to view education as simply a "right of passage," a necessary "union card," and an imposed set of hurdles with little relevance to the real world. Education is reduced to acquiring a diploma merely another commodity to be purchased in the marketplace, and the final grade becomes the overriding concern rather than learning.

Research in educational psychology has found that traditional educational approaches (e.g., lectures) do not lead to a high rate of knowledge retention. Despite intense efforts on the part of both students and teachers, most material learned through lectures is soon forgotten, and natural problem solving abilities may actually be impaired. In fact, studies have shown that in 90 days students forget 90% of everything they have been told (Smilovitz, 1996). Motivation in such traditional classroom environments is also usually low. Perhaps one of the greatest advantages of PBL is that students genuinely enjoy the process of learning. PBL is a challenging program which makes the study of organization design and change intriguing for students because they are motivated to learn by a need to understand and solve real problems. The relevance of information learned is

readily apparent; students become aware of a need for knowledge as they work to resolve the problems.

Here teacher's role changes from "sage on stage" to a "guide by the side" i.e. more likely a facilitator and coach of student learning, acting at times as a resource person, rather than as knowledge holder and disseminator. Similarly student's role is more active and engaged as a problem solver, decision maker, and meaning maker, rather than being merely a passive listener and note-taker. Thus, it has been suggested that problem-based curricula can lead to increased retention of knowledge, enhanced integration of basic scientific concepts into clinical thinking, development of self-directed learning skills and increasing intrinsic interest in the subject matter being learned. This instructional method challenges students to 'learn to learn'.

2.14 Blended learning

Blended learning is an education program both formal and informal that combines online digital media with traditional classroom 'chalk and talk' methods. It requires the physical presence of both teacher and student, with some element of student control over time, place, path, or pace. Blended learning is a student-centered approach to create a learning experience whereby the learner interacts with other students, with the instructor, and with content through thoughtful integration of online and face-to-face environments. Blended learning is realized in teaching and learning environments where there is an effective integration of different modes of delivery, models of teaching and styles of learning as a result of adopting a strategic and systematic approach to the use of technology combined with the best features of face to face interaction (Krause, K. 2007, Fig.6).

Blended learning achieves better student experiences and outcomes and more efficient teaching and course management practices. It can broaden the spaces and opportunities available for learning. It supports the provision of information and resources to students. It allows students the opportunity to interact with people beyond the face to face classroom situation. Here students can also be motivated by utilizing their interest in technology. Blended learning engages and motivates students through interactivity and collaboration. In blended learning teacher can provide students additional out of class room skill-based practice of learning opportunities such as exercises, quizzes or academic skill-based tutorials. The main four Models of Blended Learning are as follows (Figure 6)

2.14.1. Rotation Model

In this form of blended learning, students rotate between different stations on a fixed schedule, either working online or spending face to face time with teacher. When in a course or subject where students rotate on a fixed schedule or at teacher's discretion between modalities and at least one of which is online are called station rotation. Other modalities might include activities such as small group or full class instruction, group projects, individual tutoring, and pencil-paper assignments. All the activities contained in a classroom. When students were rotated between a computer laboratory and classroom for other activities such as full class instruction, group discussion, projects etc. then the model is termed as Lab Rotation. In Flipped Classroom students were delivered content and instruction through online learning off site in place of traditional homework and then attend the brick and mortar classroom situation for face to face instruction, teacher guided projects or practices. When students individualize the playlist i.e. fix or choose the schedule of rotation among the different stations and modalities i.e. face to face instruction, group discussion, projects, online learning etc, then the Model is termed as Individual rotation.

2.14.2. Flex Model

In Flex Model of blended learning the main procedure of delivering course or subject was through online while students can move on an individually customized fluid schedule among learning modalities i.e. a face to face support on a flexible adoptive as needed basis through activities such as small group instruction, group projects and individual tutoring. Here face to face learning was supplement to the main online learning. For example, some Flex models may have face to face certified teachers who supplement the online learning on a daily basis, whereas others may provide little face to face enrichment.

2.14.3. A La Carte Model

When the procedure of delivering the total course or subject was through online and even students receiving other learning experiences through an online teacher via email, Chat, blogs etc. the model is termed as A La Carte Model. The teacher of record for the A La Carte course is the online teacher. Students may take the A La Carte course either on the brick and mortar campus or off-site. This differs from full-time online learning because it is not a whole-school experience. Students take some courses a la carte and others face-to-face at a brick-and-mortar campus.

2.14.4. Enriched Virtual Model

In Enriched Virtual Model students were provided course or subject through mainly online content and instruction by an online teacher along with on demand or need basis face to face learning sessions with their same teacher specifically on weekend day. Many Enriched Virtual programs began as full-time online schools and then developed blended programs to provide students with brick and mortar school experiences. The Enriched Virtual model differs from the Flipped Classroom because in the Enriched Virtual programs, students meet face-to-face

with their teachers every weekday. It differs from a fully online course because face-to-face learning sessions are more than optional office hours or social events; they are required.

The increasing population in developing countries like India demands an economical, modern teaching learning process or method like blended learning. In blended learning there is a scope of using resources optimally. Hence blended learning is a useful Pedagogical tool for effective learning in respect of economy, time, learner's pace, optimal use of resources etc.

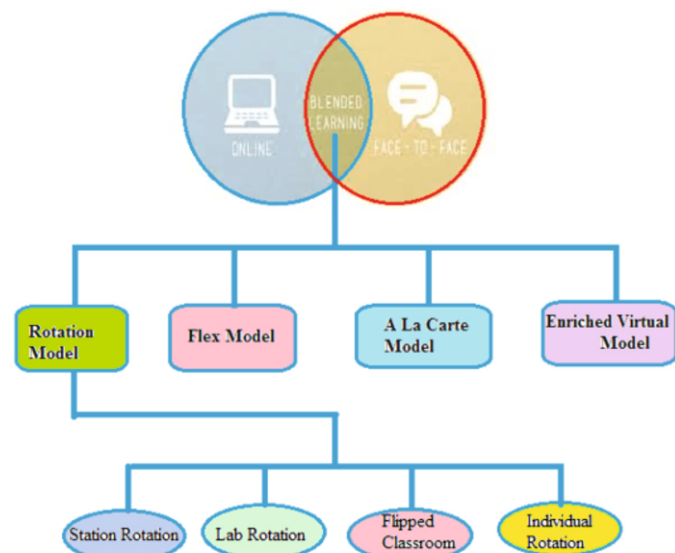


Figure 6. Schematic diagram of blended learning strategy

3. CONCLUSION

So far teaching learning is concerned; no doubt it is a complex process. No unique nonlinear strategy is effective for complete meaningful learning to occur. Hence thoughtful integration of these innovative pedagogical strategies in a greater extent largely influences effectiveness, efficiency and outcome of learning process. A pictorial representation (Figure 7) of plausible integration of the different pedagogical strategies is as follows and an intelligent progressive teacher has to select proper integration according to requirement.

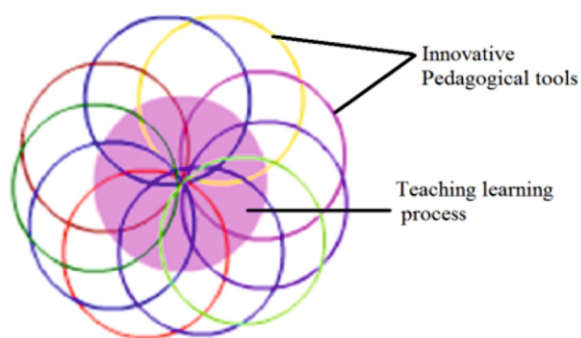


Figure 7. Pictorial representation of integrated pedagogical strategies

Thus integration of innovative strategies itself act as a novel pedagogical tool. To measure the effectiveness of such a complex pedagogical tool, fruitful research in this arena is highly encouraging. If, the suitable and proper research reveals relationship between the way of integration of these innovative pedagogical tools and the outcome of teaching learning process then more advanced learner centric or user friendly pedagogical tools evolve in future.

REFERENCES

1. Afflerbach, P., Pearson, P. D., Paris, S. H. (2008). Clarifying differences between reading skills and reading strategies. *The Reading Teacher*, 61(5), 364-373.
2. Agnew, P. W., Kellerman, A. S. & Meyer, J. (1996). *Multimedia in the Classroom*. Boston: Allyn and Bacon.
3. Allen, D.W, Ryan, K.A. (1969). *Microteaching*: Reading. Massachusetts: Addison-Wesley Publishing Company.
4. Barak, M. (2007). Transition from traditional to ICT enhanced learning environments in undergraduate courses. *Computers and Education*, 48, 30-33.
5. Boud, D. & Feletti, G. (1999). *The Challenge of Problem-Based Learning*, (2nd Ed.), London: Kogan.

6. Boyson, G., (2009) 'The Use of Mind Mapping in Teaching and Learning'. The Learning Institute, Assignment 3.
7. Bransford, J.D. & Stein, B.S. (1993). *The Ideal problem solver* (2nd Ed). New York: Freeman.
8. Bransford, J.D. et al. (1990). Anchored instruction: Why we need it and how technology can help. In D. Nix & R. Sprio (Eds), *Cognition, education and multimedia*. Hillsdale, NJ: Erlbaum Associates.
9. Bransford, J. D., Brown A. L. and Cocking R. R. (ed). (2000). *How People Learn: Brain, Mind, Experience and School*. Washington D.C.: National Academy Press. 3-23.
10. Cropley, A. (2006). In Praise of Convergent Thinking. *Creativity Research Journal*, 18 (3), 391-404.
11. Govt. of India, Ministry of Education, New Delhi, Report of the Indian Education Commission (1964-66).
12. Grewal, J.S., Singh, R. P. (1979). "A Comparative Study of the Effects of Standard MT With Varied Set of Skills Upon General Teaching Competence and Attitudes of Pre-service Secondary School Teachers." In DAS, R.C., (ed.) *Differential Effectiveness of MT Components*, New Delhi, NCERT.
13. Guilford, J. P. (1950). Creativity. *American Psychologist*, 5, 444-454.
14. Harper, G. F. & Maheady, L. (2007). Peer-mediated teaching and students with learning disabilities. *Intervention in School and Clinic*, 43, 101107. doi: 10.1177/10534512070430020101
15. Hartman, H. (2002). *Scaffolding & Cooperative Learning*. Human Learning and Instruction, New York, pp. 23-69.
16. Hills, G. (2003). Warning: Keep Chemistry in Context. *Education in chemistry*, 40(3), 84-86.
17. Hofstetter, F. T. (1995). *Multimedia Literacy*, New York: McGraw-Hill.
18. Jaramillo, J. (1996). Vygotsky's socio-cultural theory and contributions to the development of constructivist curricula. *Education*, 117(1), 133-140.
19. Johnstone, A.H., & Otis, K.H. (2006). Concept mapping in problem-based learning: A cautionary tale. *Chemistry Education Research and Practice*, 7, 84-95.
20. Jonassen, D. H., Peck, K. L., and Wilson, B. G. (1999). *Learning with Technology: A Constructivist Perspective*, New Jersey: Merrill/Prentice Hall.
21. Krause, K. (2007). Beyond classroom walls: Students' out-of-class activities and implications for teaching and learning. *Nagoya Journal of Higher Education*, 7, 301-318
22. Kunsch, C. A., Jitendra, A. K., & Sood, S. (2007). The effects of peer-mediated instruction in mathematics for students with learning problems: A research synthesis. *Learning Disabilities Research and Practice*, 22, 112. doi:10.1111/j.15405826.2007.00226.x.
23. Lindstrom, R. (1994). *The Business Week Guide to Multimedia Presentations: Create Dynamic Presentations That Inspire*, New York: McGraw-Hill.
24. Maheady, L., Harper, G. F., & Mallette, B. (2001). Peer-mediated instruction and interventions and students with mild disabilities. *Remedial and Special Education*, 22, 415.
25. Mastropieri, M. A., & Scruggs, T. E. (1998). Constructing more meaningful relationships in the classroom: Mnemonic research into practice. *Learning Disabilities Research & Practice*, 13, 138-145.
26. Mastropieri, M. A., & Scruggs, T. E. (2007). *The inclusive classroom: Strategies for effective instruction*, (3rd Ed.) Upper Saddle River, NJ: Merrill/Prentice Hall. pp.178-185.
27. McKenzie, J. (2000). *Scaffolding for Success*. [Electronic version] Beyond Technology, Questioning, Research and the Information Literate School Community, from <http://fno.org/dec99/scaffold.html>
28. Miller, G. A. (1956). The magical number seven, plus or minus two: some limits on our capacity for processing information. *Psychological Review*, 63, 81-97.
29. Ng, K. H. & Komiya, R. (2000). Introduction of Intelligent Interface to Virtual Learning Environment. Paper presented at the Multimedia University International Symposium on Information and Communication Technologies (M2USIC'2000), October 5-6, 2000, Petaling Jaya, Malaysia.
30. Nagel, D. R., Schumaker, J. B. & Deshler, D. D. (1986). *The FIRST-letter mnemonic strategy*. Lawrence, KS: EXCELL enterprises.
31. National Curriculum frame Work for Teacher Education (2009). NCERT, New Delhi.
32. National Curriculum frame Work (2005). NCERT, New Delhi.
33. Passi, B.K. (1976). *Becoming Better Teachers*. Baroda: Centre for Advanced Study in Education, M. S. University of Baroda.
34. Schumaker, J. B., Bulgren, J. A., Deshler, D. D. & Lenz, B. K. (1998). *The recall enhancement routine*. Lawrence, KS: The University of Kansas.
35. Scruggs, T. E. and Mastropieri, M. A. (1992). Classroom applications of mnemonic instruction: Acquisition, maintenance and generalization. *Exceptional Children*, 58, 219-229.
36. Smilovitz, R. (1996). *If not now when?: Education not schooling*. Morris Publishing: Kearney.
37. *Strategies of Divergent Thinking*. Retrieved from University of Washington website. <http://faculty.washington.edu/ezen/imdt.htm>.
38. Vygotsky, L.S. (1978) *Mind in Society: The Development of Higher Psychological Processes*. Cambridge: Harvard University Press.